



Serial No. 09/654,306

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant: Mosier
Filing Date: September 1, 2000
For: DISPLAY CONTROLLER WITH SPREAD-SPECTRUM TIMING
TO MINIMIZE ELECTROMAGNETIC EMISSIONS
Group Art Unit: 2673
Docket No.: 00CR104/KE
Application No.: 09/654,306
Examiner: Kovalick, Vincent E.

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BRIEF ON APPEAL

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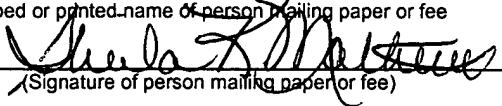
REAL PARTY IN INTEREST

This application was assigned to Rockwell Collins, Inc. having a place of
business at 400 Collins Road, NE, Cedar Rapids, Iowa, 52498.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

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STATUS OF THE CLAIMS

This is an appeal from the Final Office Action mailed January 10, 2003, finally rejecting Claims 1-22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,757,3338 (Bassetti et al.) in view of U.S. Patent No. 6,252,573 (Ito et al.). No claims have been allowed. Claims 1-22 are the subject of the present appeal.

STATUS OF THE AMENDMENTS

In response to the Final Office Action, the Applicant submitted Remarks dated April 10, 2003 with arguments traversing the rejection of claims 1-22 under 35 U.S.C. § 103(a) and requesting reconsideration of the application. In an Advisory Action dated April 18, 2003, the Examiner stated "the request for reconsideration has been considered but does not place the application in condition for allowance because the applicant's arguments are not persuasive." No amendment has been filed subsequent to the Advisory Action.

SUMMARY OF THE INVENTION

The present invention relates to reducing electromagnetic emissions in a display such as an LCD display 200. (Specification, page 1, lines 5-7). A row driving signal is modulated so that a period or frequency associated with one row is different from another row. (Specification, page 5, lines 4-16). In one embodiment, a display controller 210 is internally modified to provide variable row timing such that multiple frequencies are included in the row signal spectrum 110. (Specification, page 5, lines 4-16).

Claim 1, the representative claim for the first group, is directed to an apparatus that includes means for controlling a display. (Specification, page 4, line 28 to page 5, line 4) The means for controlling the display is adapted to provide a modulated row drive signal to the display. (Specification, page 5, lines 4-16, Table 1). At least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced. (Specification, page 1, lines 6-9). Accordingly, the modulated row driving signal has a different period for one row than for another row. (Specification, page 5, lines 4-16).

Claim 7, the representative claims of the second group, is dependent from claim 1. Claim 7 includes the additional feature that the display is an avionics display.

Claim 8, the representative claim for the third group, is directed to an apparatus that includes means for controlling a display that is adapted to provide a modulated

row driving signal to the display. (Specification, page 5, lines 4-16, Table 1). At least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced. (Specification, page 1, lines 6-9). The modulated row driving signal has a first period for a first row and a second period for a second row. (Specification, page 5, lines 4-16).

Claim 11, the representative claim for the fourth group, is dependent from claim 8. Claim 11 includes the additional feature that the display is an avionics display.

Claim 12, the representative claim for the fifth group, is directed to an apparatus that includes means for controlling a display and means for causing the controlling means to provide a modulated row driving signal to the display. (Specification, page 5, lines 4-16, Table 1). At least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced. (Specification, page 1, lines 6-9). The modulated row driving signal has a first effective frequency for a first row and a second effective frequency for a second row. (Specification, page 5, lines 4-16).

Claim 21, the representative claim for the sixth group, is directed to a method for controlling a display that includes providing a modulated row driving signal to the display to control pixels in a first row in a plurality of rows and providing the modulated row driving signal to the display to control pixels in a second row of the rows. (Specification, page 4, line 28 to page 5, line 16). The modulated row driving signal has a first effective frequency when provided to the first row and a second effective frequency when provided to the second row. (Specification, page 5, lines 4-1, Table 1).

Claim 22, the representative claim for the seventh group, is directed to a display controller for providing row signals to a display. (Specification, page 4, lines 28-32). The display controller includes a buffer for storing data and a control circuit coupled to the buffer. (Specification, page 4, line 32 to page 5, lines 4 and page 5, lines 29-32). The control circuit provides a first row signal for a row of pixels during a first row time period in accordance with first data stored in the buffer and provides a second row signal during a second row time period for another row of pixels in accordance with second data stored in the buffer. (Specification, page 5, lines 4-32). The first row time period is different than the second row time period. (Specification, page 5, lines 4-16). The first row signal and the

second row signal are spread spectrum modulated signals. (Specification, Figure 1, page 4, lines 24-27, page 5, lines 4-16).

ISSUES

1. Whether the claims of Groups 1-7 may properly be rejected under 35 U.S.C. § 103(a) based on Bassetti et al. in view of Ito et al.?

GROUPING OF THE CLAIMS

For the purposes of this appeal only, grouping of the claims is as follows:

1. Claims 1-6 essentially stand or fall together and are therefore grouped together. Independent claim 1 is the representative claim for the group because it is the broadest claim in the group.

2. Claim 7 essentially stands or falls by itself and is therefore grouped by itself. Claim 7 depends from claim 1 and includes the additional feature that the display is an avionics display.

3. Claims 8-10 essentially stand or fall together and are therefore grouped together. Independent claim 8 is the representative claim for the group because it is the broadest claim in the group. Claims 8-10 are grouped together, but separately from groups 1 and 2, because independent claim 8 includes the limitation the modulated row driving signal has a first period for a first row and a second period for a second row.

4. Claim 11 essentially stands or falls by itself and is therefore grouped by itself. Claim 7 depends from claim 8 and includes the additional feature that the display is an avionics display.

5. Claims 12-20 essentially stand or fall together and are therefore grouped together. Independent claim 12 is the representative claim for the group because it is the broadest claim in the group. Claims 12-20 are grouped together, but separately from groups 1-3, because independent claim 12 includes the limitation the modulated row driving signal has a first effective frequency for a first row and a second effective frequency for a second row.

6. Claim 21 essentially stands or falls by itself and is therefore grouped by itself. Claim 21 is grouped separately from groups 1-5 because claim 21 is directed to a method.

7. Claim 22 essentially stands or falls by itself and is therefore grouped by itself. Claim 22 is grouped separately from groups 1-6 because claim 22 is directed to a display controller for providing row signals to a display.

Thus, Appellant respectfully requests individual consideration of each of the three groups herein described. The separate patentability of groups 1-7 is discussed below in the Argument.

ARGUMENT

REFERENCES RELIED UPON

The following references were relied upon by the Examiner:

1. U.S. Patent No. 5,575,338 to Bassetti et al., issued May 26, 1998; and
2. U.S. Patent No. 6,252,573 to Ito et al., issued June 26, 2001.

BRIEF DESCRIPTION OF REFERENCES

1. U.S. Patent No. 5,757,338

U.S. Patent No. 5,757,338 to Bassetti et al. (hereinafter referred to as Bassetti) issued May 26, 1998. Bassetti teaches a controller and method that use spread-spectrum techniques to modulate a pixel clock over a range of frequencies, reducing the maximum intensity of EMI emissions. (Bassetti, Abstract, col. 2, lines 29-30). In one embodiment, the vertical and horizontal timing signals for a CRT and LCD are generated using an un-modulated clock to ensure that each horizontal timing signal is constant and the horizontal period does not vary. (Bassetti, Abstract, col. 6, lines 30-39, col. 11, lines 34-40 and lines 45-55 and col. 13, lines 27-30). In another embodiment, the timing signals are modulated, but in order to ensure each horizontal line's period is the same, the clock modulation is always reset at the end of every horizontal line. (Bassetti, Abstract, col. 13, lines 37-42 and col. 15, lines 51-57). Therefore, variations in frequency never occur from one line to another line. (Bassetti, col. 15, lines 51-57).

2. U.S. Patent No. 6,252,573

U.S. Patent No. 6,252,573 to Ito et al. (hereinafter referred to as Ito) issued June 26, 2001. Ito teaches a driving method for a liquid crystal display having a plurality of row electrodes and column electrodes. (Ito, Abstract, col. 1, lines 15-21). A group of the

plurality of the row electrodes is sequentially selected in a selection period. The selection period is then divided and separated into a plurality of intervals within one frame period. (Ito, col. 10, lines 54-59). In one embodiment, a voltage ON and OFF pattern, is used to apply a waveform to row electrodes X_1 , X_2 , and X_3 . (Ito, Figures 15(a)-(c), Table E, col. 21, lines 21-30). The waveforms applied in accordance with Figure 15, have many different frequency components that appear to cause distortion of the displayed image. (Ito, col. 21, lines 31-39). Accordingly, the voltage waveforms are changed to eliminate the deviation of the frequency components. (Ito, col. 21, lines 40-41). Each applied voltage waveform appears to have the same total period of $8\Delta t$. (Ito, col. 21, lines 34-38 and col. 22, lines 5-10).

BACKGROUND

All claim rejections at issue in this appeal are made under 35 U.S.C. § 103(a)¹. The legal standards under 35 U.S.C. § 103(a) are well-settled.

Obviousness under 35 U.S.C. § 103(a) is a legal conclusion involving four factual inquiries:

- (1) the scope and content of the prior art;
- (2) the differences between the claims and the prior art;
- (3) the level of ordinary skill in the pertinent art; and
- (4) secondary considerations, if any, of non-obviousness.

Litton Systems, Inc. v. Honeywell, Inc., 87 F. 3d 1559, 1567, 39 U.S.P.Q. 2d 1321, 1325 (Fed. Cir. 1996). See also Graham v. John Deere Co., 383 U.S. 1, 148 U.S.P.Q. 459 (1966).

In proceedings before the Patent and Trademark Office (PTO), the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. In re Piasecki, 745 F.2d 1468, 1471-72, 223 U.S.P.Q. 785, 787-88 (Fed. Cir. 1984). A prima facie case of obviousness requires that the prior art reference or references teaches or suggests all of the claimed limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974); Manual of Patent Examining Procedure (MPEP), Edition 8(e8), August 2001, Sections 2142,

¹ "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made." 35 U.S.C. §103(a).

2143.03. "The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fritch, 972 F.2d 1260 (Fed. Cir. 1992); In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988); In re Lalu, 747 F.2d 703,705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 U.S.P.Q. 657, 667 n.24 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 782 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. ACS Hospital Systems, 732 F.2d at 1577, 221 U.S.P.Q. at 933. Under 35 U.S.C. § 103(a), "teachings of references can be combined only if there is some suggestion or incentive to do so." In re Fritch, 972 F.2d at 126. When a reference teaches away from the claimed invention, that teaching is strong evidence of non-obviousness. See U.S. v. Adams, 383 U.S. 39, 148 U.S.P.Q. 79 (1966); In re Royka, 490 F. 2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

REJECTIONS

1. The claims of Groups 1-7 are patentable under 35 U.S.C. § 103(a) over Bassetti in view of Ito because neither Bassetti nor Ito teach or suggest a Modulated Row Driving Signal having Differing Periods or Effective Frequencies for First and Second Rows Limitation.

In paragraph 3 of the Final Office Action, the Examiner rejected the claims in Groups 1-7 as being unpatentable under 35 U.S.C. § 103(a) over Bassetti in view of Ito. Each of the independent claims 1, 8, 12, 21 and 22 recite a feature related to the provision of a row signal, in particular, a feature in which the row driving signal is modulated so that a period or frequency associated with one row is different from another row. Independent claim 1 recites:

said controlling means being adapted to provide a modulated row driving signal to the display, wherein at least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced, wherein the modulated row driving signal has a different period for one row that for another row.

Independent claim 8 recites:

said controlling means being adapted to provide a modulated row driving signal to the display wherein at least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced, said input data providing means being adapted to provide a modulated input data signal to said controlling means to accommodate the modulated row driving signal provided by said controlling means to the display, the modulated row driving signal having a first period for a first row, and a second period for a second row.

Independent claim 12 recites:

means for causing said controlling means to provide a modulated row driving signal to the display wherein at least one frequency component of the modulated row driving signal is attenuated by the modulation such that emanated electromagnetic emissions are reduced, the modulated row driving signal having a first effective frequency for a first row, and a second effective frequency for a second row.

Independent claim 21 recites:

the modulated row driving signal having a first effective frequency when provided to the first row and a second effective frequency when provided to the second row.

Independent claim 22 recites:

providing a first row signal for a row of pixels during a first row time period in accordance with first data stored in the buffer, and the control circuit providing a second row signal during a second row time period for another row of pixels in accordance with second data stored in the buffer, the first row time period being different than the second row time period.

As stated in the present application:

In accordance with one embodiment in the present invention, LCD controller 210 is internally modified to provide a variable row timing such that

multiple frequencies are included in the row signal spectrum. . . . An example of distribution row times is shown in Table 1.

See Specification, page 5, lines 1-16. Table 1 of the present application shows exemplary row time periods of 20 to 20.72 microseconds and effective frequencies of 12.5 to 12.042 kHz.

In contrast, neither Bassetti nor Ito teaches or suggests the variation of the frequency, periods or times for the row driving signal as recited in independent claims 1, 8, 12, 21 and 22. Rather, Bassetti teaches various systems and methods for reducing EMI emissions using spread-spectrum techniques to modulate a pixel clock while maintaining the same frequency/timing for each horizontal line. (See, Bassetti, Abstract, col. 11, lines 34-40 and col. 15, lines 51-57). In one embodiment, the clock signal associated with the video clock is modulated but not the horizontal and vertical timing signals. (See, Bassetti, col. 11, lines 14-19 and lines 34-40). The horizontal timing signals are generated using an un-modulated clock signal so that the row signals have the same frequency or period. (See, Bassetti, col. 11, lines 34-57). In a second embodiment, while the horizontal and vertical timing signals are modulated, the clock modulation is reset at the end of every horizontal line so that the period or frequency of each horizontal line is the same. (See, Bassetti, col. 13, lines 37-42 and col. 15, lines 51-57). Bassetti increases frequency during a first half of the horizontal line and decreases it during the latter half of the horizontal line to ensure a constant time period for each horizontal line to ensure that a constant row time is achieved. (See, Bassetti, col. 14, line 31-42). At paragraph 3 of the Final Office Action, the Examiner admits that Bassetti does not teach means for the controlling a display wherein the modulated row driving signal has a different period or frequency for one row than for another row. See Final Office Action, page 3. Accordingly, Bassetti provides no teaching or suggestion for varying the period, the time or the frequency of the row signal as recited in independent claims 1, 8, 12, 21 and 22.

Ito also does not teach or suggest a row signal with a varying period, time or frequency for one row than for another. Rather, Ito teaches a row signal having the same period or frequency, for example, the frame period F. (See, Ito, Figures 15(a)-(c), Figures 16(a)-(d) and Figures 17(a)-(d), col. 24, lines 14-16 and lines 32-35). Ito shows voltage waveforms that are applied to row electrodes using a particular voltage ON and OFF pattern. (See, Ito, col. 21, lines 21-30). However, the frequency and period of the entire row is

maintained constant as it is turned on and off and as the row selection waveforms are applied to row electrodes. (See, Ito, Figures 15(a)-(c), Figures 16(a)-(d), col. 21, lines 32-39 and col. 22, lines 5-10). The example waveforms cited by the Examiner in the Final Office Action have the exact same period. (See, Ito, Figures 15(a)-(c), Figures 16(a)-(d)). The row signals X_1 - X_3 in Figures 15(a)-(c) have the same total period of $8\Delta t$. (See, Ito, col. 21, lines 32-39 and col. 22, lines 7-10). The method in Ito maintains an entire row signal period (e.g., frame period F) and frequency constant. In addition, the frequencies described in the cited section of Ito by the Examiner refer to frequencies within the row signal and are not related to modifying the row period itself. (See, Ito, col. 21, lines 25-30). Ito provides no teaching or suggestion for varying the period, the time or the frequency of the row signal as recited in independent claims 1, 8, 12, 21 and 22.

As mentioned above, a prima facie case of obviousness requires that the prior art reference or references teaches or suggests all of the claimed limitations. See In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974); MPEP, Edition 8(e8), August 2001, Sections 2142, 2143.03. As discussed above, neither Bassetti nor Ito teaches or suggests a row driving signal that is modulated so that a period or frequency associated with one row is different from another row. Accordingly, the claims of Groups 1-7 are patentable over Bassetti in view of Ito.

2. The claims of Groups 1-7 are patentable under 35 U.S.C. § 103(a) over Bassetti in view of Ito because both Bassetti and Ito teach away from the Differing Periods or Effective Frequencies for a First and Second Row Limitation.

As discussed in section 1, neither Bassetti nor Ito teaches or suggests the structures/steps recited in independent claims 1, 8, 12, 21 and 22, in particular, the limitation that the row driving signal is modulated so that a period or frequency associated with one row is different from another row. In addition, each reference, Bassetti and Ito, teaches away from such a technique.

Bassetti teaches away from the principles of the present invention. As discussed above in section 1, Bassetti teaches that the period for the row signal must remain constant whether or not the horizontal and vertical timing signals are generated with or without modulation. Bassetti states:

The vertical and horizontal timing signals for both the CRT and LCD are generated from an un-modulated clock. Using an un-modulated clock for

these critical timing signals ensures that each horizontal line is displayed for the same period of time. See, Bassetti, Abstract.

The pixels are transferred to the flat-panel display using the frequency modulated video clock, reducing EMI, but the horizontal and vertical timing signals are generated by the video clock without modulation. See, Bassetti, col. 6, lines 30-39.

The modulated video clock is not used so that these critical timing signals are always constant and never varied due to clock modulation. Thus, the horizontal period does not vary, . . . See, Bassetti, col. 11, lines 34-40.

Each horizontal line's period must be identical. See, Bassetti, col. 13, lines 27-30.

The horizontal and vertical timing signals for both the CRT and the LCD are both generated from the modulated video clock. No variations occur in either the vertical or horizontal timing signals since the clock modulation are always reset at the end of every horizontal line. Thus while frequency variations occur during a line, variations never occur from one line to another line. See, Bassetti, col. 15, lines 51-57.

Accordingly, one of ordinary skill in the art reviewing Bassetti would not consider changing the frequency, time or periods associated with the row signals because Bassetti teaches away from the concept. Accordingly, Bassetti teaches away from the claimed invention.

Ito also teaches away from the claimed invention. As discussed above in section 1, Ito teaches a row signal having the same period or frequency. (See, Ito, Figures 15(a)-(c), Figures 16(a)-(d) and Figures 17(a)-(d), col. 24, lines 14-16 and lines 32-35). Ito appears to use a row signal which is turned on and off in a pattern. (See, Ito, col. 21, lines 21-30). However, the frequency and period of the entire row signal (e.g., frame period F) is maintained constant as it is turned on and off and as the row selection waveforms are applied to the row electrodes. (See, Ito, Figures 15(a)-(c), Figures 16(a)-(d), col. 21, lines 32-39 and col. 22, lines 5-10). Applicant notes that the example waveforms in Ito cited by the Examiner in the Final Office Action have the same period. (See, Ito, Figures 15(a)-(c)). The row signal X1-X3 in Figures 15(a)-(c) have a total period of $8\Delta t$. (See, Ito, column 22, lines 7-10).

The frequencies described in the cited section of Ito by the Examiner in the Final Office Action refer to frequencies within the row signal and are not related to modifying the row period itself. (See, Ito, col. 21, lines 32-42). Again, each row has a total period of four pulses on and four pulses off for a total period of $8\Delta t$. (See, Ito, column 21, lines 25-30, Table E). Further, there is nothing in Ito which refers to a change in spectral content of the timing. Ito merely ensures that rows are enabled in an overlapping but distinguishable fashion. Accordingly, it is respectfully submitted that Ito teaches away from varying row frequencies and periods.

Both Bassetti and Ito teach away from the claimed invention. As discussed above, teaching away from the claimed invention is strong evidence of non-obviousness. See U.S. v. Adams, 383 U.S. 39, 148 U.S.P.Q. 79 (1966); In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). Accordingly, the claims of Groups 1-7 are patentable over Bassetti in view of Ito which teach away from the invention as recited in the claims of Groups 1-7.

3. Groups 2 and 4 are patentable under 35 U.S.C. § 103(a) over Bassetti in view of Ito because neither Bassetti nor Ito teach or suggest the Display Comprising an Avionics display Limitation.

Dependent claims 7 and 11 recite a feature wherein the display comprises an avionics display. In contrast, neither Bassetti nor Ito teaches or suggests a display comprising an avionics display as recited in dependent claim 7 and 11.

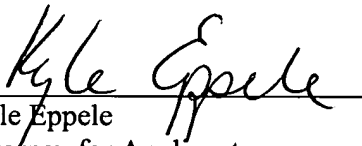
As mentioned above, a prima facie case of obviousness requires that the prior art reference or references teaches or suggests all of the claimed limitations. See In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974); MPEP, Edition 8(e8), August 2001, Sections 2142, 2143.03. As discussed above, neither Bassetti nor Ito teaches or suggests a display comprising an avionics display. Accordingly, the claims of Groups 2 and 4 are patentable over Bassetti in view of Ito.

CONCLUSION

In view of the foregoing, the Appellant submits that the claims are not properly rejected as being unpatentable under 35 U.S.C. § 103(a) under the cited references. Accordingly, it is respectfully requested that the board reverse the claim rejections and indicate that a Notice of Allowance respecting all pending claims be issued.

Dated this 3rd day of July, 2003

Respectfully submitted,



Kyle Eppeler
Attorney for Applicant
Reg. No. 34, 155

ROCKWELL COLLINS, INC.
400 Collins Road, NE
Cedar Rapids, IA 52498
Telephone: (319) 295-8280
Facsimile: (319) 295-8777
Customer No. 26383

APPENDIX - THE CLAIMS ON APPEAL

1 1. An apparatus, comprising:
2 means for controlling a display; and
3 means for buffering input data received from a data source provided to
4 said controlling means;
5 said controlling means being adapted to provide a modulated row
6 driving signal to the display, wherein at least one frequency component of the
7 modulated row driving signal is attenuated by the modulation such that emanated
8 electromagnetic emissions are reduced, wherein the modulated row driving signal has
9 a different period for one row than for another row.

1 2. An apparatus as claimed in claim 1, the modulated row driving
2 signal provided by said controlling means being a spread spectrum modulated signal.

1 3. An apparatus as claimed in claim 1, said controlling means
2 comprising a controller structure.

1 4. An apparatus as claimed in claim 1, said buffering means
2 comprising a memory structure.

1 5. An apparatus as claimed in claim 1, said buffering means
2 comprising a FIFO memory structure.

1 6. An apparatus as claimed in claim 1, said controlling means
2 comprising a controller structure, said buffering means comprising a FIFO memory
3 structure, and the modulated row driving signal provided by the controller structure
4 being a spread spectrum signal.

1 7. An apparatus as claimed in claim 1, the display comprising an
2 avionics display.

1 8. An apparatus, comprising:
2 means for controlling a display; and
3 means for providing input data to be displayed in the display to said
4 controlling means;

5 said controlling means being adapted to provide a modulated row
6 driving signal to the display wherein at least one frequency component of the
7 modulated row driving signal is attenuated by the modulation such that emanated
8 electromagnetic emissions are reduced, said input data providing means being adapted
9 to provide a modulated input data signal to said controlling means to accommodate
10 the modulated row driving signal provided by said controlling means to the display,
11 the modulated row driving signal having a first period for a first row, and a second
12 period for a second row.

1 9. An apparatus as claimed in claim 8, the modulated row driving
2 signal provided by said controlling means being a spread spectrum signal.

1 10. An apparatus as claimed in claim 8, said controlling means
2 comprising a controller structure.

1 11. An apparatus as claimed in claim 8, the display comprising an
2 avionics display.

1 12. An apparatus, comprising:

2 means for controlling a display; and

3 means for causing said controlling means to provide a modulated row
4 driving signal to the display wherein at least one frequency component of the
5 modulated row driving signal is attenuated by the modulation such that emanated
6 electromagnetic emissions are reduced, the modulated row driving signal having a
7 first effective frequency for a first row, and a second effective frequency for a second
8 row.

1 13. An apparatus as claimed in claim 12, the modulated row
2 driving signal provided by said controlling means being a spread spectrum signal.

1 14. An apparatus as claimed in claim 12, further comprising means
2 for buffering input data received from a data source provided to said controlling
3 means.

1 15. An apparatus as claimed in claim 12, further comprising means
2 for providing input data to be displayed in the display to said controlling means, said
3 input data providing means being adapted to provide a modulated input data signal to
4 said controlling means to accommodate the modulated row driving signal provided by
5 said controlling means to the display.

1 16. An apparatus as claimed in claim 12, said controlling means
2 comprising a controller structure.

1 17. An apparatus as claimed in claim 12, said causing means
2 comprising a modulating circuit structure.

1 18. An apparatus as claimed in claim 12, said controlling means
2 comprising a controller structure, and said causing means comprising a modulating
3 circuit structure.

1 19. An apparatus as claims in claim 12, further comprising a
2 memory structure for buffering input data received from a data source provided to
3 said controlling means.

1 20. An apparatus as claimed in claim 12, further comprising a
2 FIFO memory structure for buffering input data received from a data source provided
3 to said controlling means.

1 21. A method of controlling a display, the method comprising:

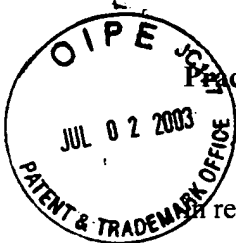
2 providing a modulated row driving signal to the display to control
3 pixels in a first row of a plurality of rows; and

4 providing the modulated row driving signal to the display to control
5 pixels in a second row of the rows, the modulated row driving signal having a first
6 effective frequency when provided to the first row and a second effective frequency
7 when provided to the second row.

1 22. A display controller for providing row signals to a display, the
2 display controller comprising:
3 a buffer; and
4 a control circuit coupled to the buffer, the buffer storing data, the
5 control circuit providing a first row signal for a row of pixels during a first row time
6 period in accordance with first data stored in the buffer, and the control circuit
7 providing a second row signal during a second row time period for another row of
8 pixels in accordance with second data stored in the buffer, the first row time period
9 being different than the second row time period, wherein the first row signal and
10 second row signal are spread spectrum modulated signals.

07-67-03

AF/2673



Practitioner's Docket No. 00CR104/KE

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Donald E. Mosier

Application No.: 09/654,306

Group No.: 2673

Filed: 09/01/2000

Examiner: V. Kovalick

For: Display Controller With Spread-Spectrum Timing To Minimize Electromagnetic Emissions

Mail Stop Appeal Briefs – Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

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TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 1.192)

1. Transmitted herewith, in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on May 8, 2003.
2. STATUS OF APPLICANT

This application is on behalf of other than a small entity.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*

(When using Express Mail, the Express Mail label number is **mandatory**;
Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

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G deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. § 1.8(a)

G with sufficient postage as first class mail.

37 C.F.R. § 1.10*

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TRANSMISSION

G facsimile transmitted to the Patent and Trademark Office, (703) _____

Signature

Sheila K. Mathews

Date: July 3, 2003

(type or print name of person certifying)

* Only the date of filing (' 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under ' 1.8 continues to be taken into account in determining timeliness. See ' 1.703(f). Consider "Express Mail Post Office to Addressee" (' 1.10) or facsimile transmission (' 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

3. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 C.F.R. § 1.17(c), the fee for filing the Appeal Brief is:

other than a small entity \$320.00

Appeal Brief fee due \$320.00

4. EXTENSION OF TERM

The proceedings herein are for a patent application and the provisions of 37 C.F.R. § 1.136 apply.

Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. TOTAL FEE DUE

The total fee due is:

Appeal brief fee \$320.00
Extension fee (if any) \$0.00

TOTAL FEE DUE \$320.00

6. FEE PAYMENT


Authorization is hereby made to charge the amount of \$320.00 to Deposit Account No. 18-1722.

A duplicate of this transmittal is attached.

7. FEE DEFICIENCY

If any additional extension and/or fee is required, and if any additional fee for claims is required, charge Deposit Account No. 18-1722.

Reg. No.: 34,155
Tel. No.: 319-295-8280
Customer No.: 26383



Signature of Practitioner
Kyle Eppele
Rockwell Collins, Inc.
Intellectual Property Department M/S 124-323
400 Collins Road NE
Cedar Rapids, IA 52498